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EXAMINER

SCHARICH, MARC A

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Please find below and/or attached an Office communication concerning this application or proceeding.

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/796,301
Filing Date: March 10, 2004
Appellant(s): HAMAKITA ET AL.

Scott M. Tulino
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 10/20/2008 appealing from the Office action mailed 3/18/2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,482,127	EDA ET AL.	01-1996
3,234,758	LEWIS JAMES H	02-1966
6,900,564	KOBAYASHI ET AL.	05-2005

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 10, 12, 14 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eda et al., U.S. Patent No. 5,482,127, in view of Lewis, U.S. Patent No. 3,234,758.

Eda et al. discloses an electric power steering device (100) (*shown overall in FIG. 1 and more detailed in FIG. 2*) for transmitting a rotation of an electric motor (102) for assisting operation of steering which is reduced via a speed reduction mechanism [*comprised of reduction worm gear (103a) and worm wheel (104)*] to a steering

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mechanism (not shown). The electric power steering device (100) further contains a joint comprising a first transmission shaft (130) that contains a male spline portion (130b); a cylindrical portion (131b) that contains a female spline portion (131c) that mutually engages with the male spline portion (130b) and appears to be completely devoid of an O-ring; and the joint ultimately being connected to a rotary shaft (not shown) of electric motor (102) for transmitting the rotation of the motor (102) to the speed reduction mechanism [*reduction worm gear (103a) and worm wheel (104)*].

Eda et al. *fails to disclose or suggest* a motivation for: charging grease in a gap between the male splined portion of the first transmission shaft and the female splined portion on the cylindrical body; the grease including a base oil having a kinetic viscosity of 1000 to 5000 mm²/s (40°C), and a worked penetration of the grease being not more than 300; *or* the kinetic viscosity of the base oil being not more than 2500 mm²/s; *or* the kinetic viscosity of the base oil being not less than 1500 mm²/s; *or* the worked penetration of the grease being not more than 260; the worked penetration of the grease being not less than 200 *or* the worked penetration of the grease being between 200 and 260.

It has been well-known in the art for many years, *however*, that various compositions of lubricants may be included (“charged”) between male and female spline engagements that rotate and endure load (torque). For instance, Lewis discloses a drive shaft slip spline assembly which includes a rotating driving means (12) with axial male splines (17) that engage axial female splines on an inner circumferential periphery (16) of a cylindrical end piece (14) that is connected to a vehicle drive shaft (10).

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Further, Lewis discloses that lubricants, such as grease or oil, may be employed between male and female spline portions (i.e. col. 2, lines 27-29). It is also known, and as Lewis discloses, that higher viscosity lubricants, such as heavy oils and greases, have customarily been employed to lubricate highly loaded contacting surfaces (col. 1, lines 28-30) (such as between the male and female splines of the disclosed invention of Lewis) for obvious reasons such as helping to relieve friction in high loaded [torque] conditions to prevent wear and friction in jointed assemblies with slip splines. Although Lewis does not specifically disclose or mention specific greases having kinematic viscosities or worked penetrations within the claimed values of the present application, it is well-known and obvious that greases with various physical properties are on the market and may be *optimally selected and used* (i.e. based on testing or other experimentation) in such a manner as to be optimal for the intended application. Basically, kinematic viscosities or worked penetrations are merely tested physical properties (i.e. per ASTM –D445 standards) of lubricants, NOT part of an actual chemical composition, and it is well-known and obvious to select and try optimal greases with appropriate physical properties to optimize a function on a particular mechanical application (such as providing a desired effect between male and female splines). Therefore, considering the teachings of Lewis (utilization of grease between male and female spline joints) and the well-known fact that greases available on the market with certain known physical properties may optimize a particular mechanical application, it would have been *blatantly obvious* to one having ordinary skill in the art at the time of the invention to include or “charge” grease in a gap between the male

splined portion of the first transmission shaft and the female splined portion on the cylindrical body on Eda et al.'s invention (*for the benefits as discussed above*) with an available grease on the market that exhibits such known physical properties of kinematic viscosity and worked penetration in the ranges as claimed by the present application in order to reduce wear or friction in the rotating spline joint.

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eda et al., U.S. Patent No. 5,482,127, in view of Lewis, U.S. Patent No. 3,234,758, and in further view of Kobayashi et al., U.S. Patent No. 6,900,564.

In combination, Eda et al. and Lewis fail to disclose a worm wheel comprising a synthetic resin, such as polyacetal, terephthalate, or polybutylene terephthalate. Kobayashi et al. discloses an electric power steering system, very similar in nature to that of Eda et al., with a worm wheel (19), having teeth formed of a polyacetal resin (POM). It is very well known and *blatently obvious* that such gears or worm wheels may be manufactured from many materials (such as metals or polymers) depending on the particular application. Therefore, based on the teachings of Kobayashi et al., it would have been obvious to one having ordinary skill in the art at the time of the invention to manufacture the worm wheel (or part of the worm wheel) in Eda et al.'s invention, and in combination with the teachings of Lewis, out of a polyacetal resin (POM) for optimal performance depending on the operating conditions of the particular application in which the worm wheel is utilized.

(10) Response to Argument

Response to arguments related to the 103(a) rejection of claims 1-5, 10,12 ,14 and 16 as being unpatentable over Eda et al. (5,482,127) in view of Lewis (3,234,758), and in further view {regarding claim 11} of Kobayashi et al. (6,900,564).

Appellants' Argument: "Accordingly, the Examiner has invoked official notice for claim 1 (and similarly claims 12, 14, and 16), because the Examiner has not provided any teaching in Eda nor Lewis (nor anywhere else for that matter) to support his allegation. Appellants submit that the Examiner has inappropriately invoked official notice in the rejection of claim 1."

Examiner's Response: The Examiner has never invoked official notice, nor has the Examiner intended to imply invoking official notice throughout the entire prosecution of the present application. It is noted that the Examiner has repeatedly expressed to the Appellant throughout prosecution that no official notice has been invoked.

Appellants' Argument: "Furthermore, the Examiner cannot merely allege that features recited in a claim are "well known in the art", but instead must consider whether the feature is "capable of instant and unquestionable demonstration as being well-known". For example, it may be proper for an Examiner to allege it is well-known that the boiling point of water is 100°C, or that Force=mass x acceleration. The features recited in the

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claimed invention, however, are not well known like, for example, the boiling point of water."

Examiner's Response: The Examiner has not alleged that using the *specific* grease having the *specific* values of kinematic viscosity and worked penetration, *as claimed*, are well-known (*based on the numerical values themselves*) but that using an appropriate "off the shelf" grease to achieve optimum or desired results for a specific application (steering device) is well-known and obvious to try. The optimum or desired grease, *as claimed*, that Appellant has chosen to use based on apparent factors such as experimentation, etc., happens to also exhibit the specific range of values of kinematic viscosity and worked penetration, *as claimed*. In other words, Appellant has 'found' the optimal grease to use on the splines of the electric power steering device of the present application, and has chosen to claim the actual numerical values of such physical properties. Furthermore, since it appears that Appellant wishes to apply analogies in their arguments (*i.e. "boiling point of water is 100°C*), the Examiner asserts the analogy that Appellant is essentially claiming "*an engine [steering device], being filled [charged] with an oil [grease] having a physical property rating [viscosity] of 10W-30 [a numerical value of found by testing (i.e. ASTM), comparable to kinematic viscosity and worked penetration]*". Such an analogy doesn't make claims claiming the use of 10W-30 motor oil in an engine allowable.

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Appellants' Argument: "Indeed, as pointed out in the Specification (e.g., see pages 1-3), conventional techniques use greases having either low viscosities (e.g., 100 to 300 mm²/s) or high viscosities (e.g., 10,000 to 30,000 mm²/s). When a grease having a low viscosity is used gear noise is generated in the engagement portion. When a grease having a high viscosity is used, it is difficult to insert and engage the male engagement member with the female engagement member. According to the claimed invention, a grease having an intermediate viscosity (e.g., 1000 to 5000 mm²/s is used."

Examiner's Response: The Appellant's arguments above indirectly support the Examiner's position that selecting an appropriate grease with desired physical properties would have been *obvious* to one having ordinary skill in the art. The Appellants openly admit the difficulties of using conventional greases with low or high viscosities. Considering the Appellants' own admission and awareness of the problems associated with using conventional grease having low or high viscosities, the examiner contends that it would then be *obvious* to one of ordinary skill to try a grease having a kinematic viscosity within an intermediate range of values. It is not disclosed anywhere in the present application that the Appellants have actually invented the grease, or any chemical compositions of the grease for that matter, yet the appellants claim using a specific grease [(i.e. a grease including a base oil having a kinetic viscosity of 1000 to 5000 mm²/s (40 °C)]. The Examiner believes that such a grease having such specific values were not just randomly selected, but were optimally chosen based on testing and/or other 'try-out' experimentation.

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In conclusion, the Appellants have merely chosen an optimal grease available on the market (*since they haven't disclosed inventing the grease*) having an intermediate range of physical property values (in which Appellant has claimed) to optimize the particular application (steering device), which would have been obvious to one having ordinary skill in the art at the time of the invention to try.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Marc A. Scharich/

Patent Examiner, Art Unit 3611

/Paul N. Dickson/

SPE Art Unit 3611

Conferees:

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